Healthy soils:

A critical resource for Canada and the world

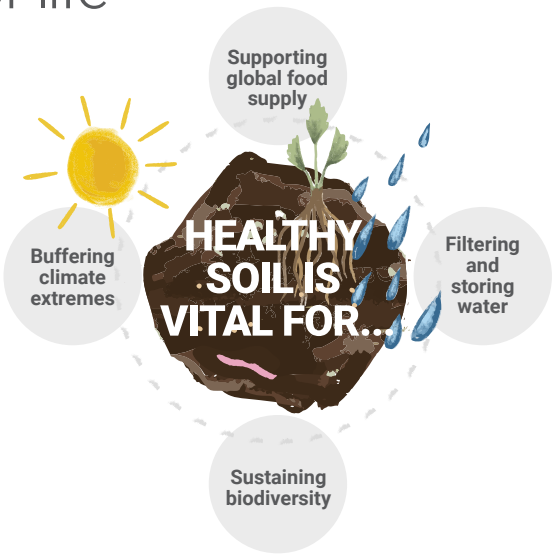
This issue brief on healthy soils was written by **Dr. Laura Van Eerd,** Charlotte Products Chair in Net Zero Soil Management at the University of Guelph Ridgetown Campus, **Heather White,** Knowledge Mobilization and Communications Coordinator for Soils At Guelph at the University of Guelph, and **Janice LeBoeuf,** Sustainable Agriculture Lead for the Arrell Food Institute at the University of Guelph.

Healthy soil: one of the foundations of life

Soil supports 95% of the global food supply and is responsible for other critical functions like filtering and storing water, buffering climate extremes, and sustaining biodiversity. These functions aren't just beneficial—they're vital to the health of people, animals and plants alike.

However, the FAO estimates that 33% of the Earth's soils are already degraded, and warns that, without action, over 90% could be degraded by 2050.[1] Degraded soils can't perform these life-sustaining functions.

At the same time, it is estimated that within 25 years, the global food production requirement will exceed the capacity of the available land by 50%, if current trends continue.[2] Thus, there is a clear need for action to protect our soils.



The Canadian agricultural context

Given the important ecological and agricultural functions of soil, a strong argument can be made that all Canadians—not just the 1.6% of the population that currently farm in Canada—have an interest in creating agricultural systems that build and maintain soil health.

Canadian farmers manage over 38 million hectares of cropland, making this country ninth in the world for land area in crop production. Additionally, Canada has over 18 million hectares of permanent meadows and pasture. These agricultural soils are managed within diverse climate zones, each with distinct precipitation patterns and temperature ranges in addition to varying soil characteristics. These differences affect the productive capacity of each region, resulting in unique limitations for soil management and cropping capabilities across the country.

Soils are the foundation of food systems.

Protecting and investing in soil is key to food security. All Canadians have a vested interest in soils and an opportunity to take action.

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Managing agricultural soils in Canada is complex.

While most farmland is privately owned, both provinces and the federal government also make rules that impact land, such as property and civil rights law, food safety and resource use frameworks, transboundary environmental policies like climate protocols, and overarching principles of peace, order and good governance. Increasingly, private corporations are also engaging with soil health, driven by emerging Scope 3 greenhouse gas protocols that require them to account for environmental impacts across their supply chains, including those related to agricultural soils.

There is still work to be done.

- Canada is losing productive soil. Between 2016 and 2021, Canada lost over 5 million acres of agricultural land.[3] That's 3% of Canada's agricultural land base.
- Canadian agricultural products must compete in a global market, and Canada's financial support of agri-environmental programming is lower than that of key competitors, including the US, Europe and China.[4]
- Economic structures within globalized agriculture tend to reward scale, uniformity and standardization—principles that often conflict with the localized, diverse and adaptive practices needed to support healthy agricultural soils. This creates a fundamental challenge for soil governance within supply chains and policy frameworks shaped by efficiency-driven models.[5]

All of this is occurring as Canada may be losing future expertise in soil science. Two generations ago (1980), soil science was a standalone department at six of Canada's major agricultural universities. Today, only two of these departments remain, with soil science more commonly offered through integrated graduate programs. This shift reflects the broader context of agri-food systems and encourages interdisciplinary collaboration, but it may also limit opportunities for deep specialization in Canadian agricultural soil science.

The challenge ahead

Safeguarding the health and productivity of Canada's soils for future generations will require continued innovations and long-term commitment.

The challenge ahead is to develop the solutions—technical, economic and political—to advance agricultural systems that reward the productivity and functionality of healthy soil. This will no doubt require new ways of collaborating across disciplines, sectors and jurisdictions. The work needs to start now. Our future growing seasons depend on it.

Calls to action

Governments and the private sector can:

- Support policy and programs that strengthen producers' ability to protect soils and build agricultural resilience.
- Incentivize soil stewardship, and build economic systems that compensate producers for ecosystem services provided.
- Invest in soil research and innovation (including people and infrastructure) and strengthen agricultural extension to lead innovation, quantify impacts and enhance knowledge for the long term.

Agri-food supply chain stakeholders can:

- Mobilize incentives for implementing practices that care for soil and provide environmental benefits.
- Prioritize purchasing from producers and suppliers who protect soil and the environment.

Landowners can:

- Implement soil care practices.
- Include soil care practices in land rental agreements and commit to longer-term agreements that allow investment in the soil.

Individuals can:

- Recognize that farmland is not empty, nor is it land awaiting development. Decrease the incentive for urban sprawl by not purchasing recently developed land and by not shopping in these newly developed areas. Petition local governments to focus on growth without sprawl.
- Implement soil health practices on your property. Compost, enhance native plant diversity, and use cover crops to protect the soil and build soil health.
- Get to know soil champions. See the OSCIA Soil Champion Award *(www.ontariosoilcrop.org/oscia-soil-champion-award/)*, and these case studies from Farm and Food Care Ontario *(www.farmfoodcareon.org/farming-and-the-environment/soil-health/)* and Soil First Farming *(www.soilfirstfarming.ca/)*.

For more information about soil health in Canada, connect with Soils at Guelph:
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Further reading

1 Senate of Canada. *Critical Ground: Report of the Standing Senate Committee on Agriculture and Forestry.* June 6, 2024. https://sencanada.ca/content/sen/committee/441/AGFO/reports/2024-06-06_CriticalGround_e.pdf.

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2 KPMG. *Reimagining Global Food System Resilience.* 2025. https://assets.kpmg.com/content/dam/kpmgsites/xx/pdf/2025/06/reimagining-global-food-system-resilience-report.pdf.

3 Statistics Canada. "Table 32-10-0153-01: Farm Operating Revenues and Expenses, Annual." https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3210015301.

4 Rude, James, Alex Eagle, and Peter Boxall. "Agricultural Support Policy in Canada: What Are the Environmental Consequences?" *Environmental Reviews* 24 (2015). https://doi.org/10.1139/er-2015-0050.

5 International Panel of Experts on Sustainable Food Systems. *From Uniformity to Diversity: A Paradigm Shift from Industrial Agriculture to Diversified Agroecological Systems.* 2016. https://ipes-food.org/report-summary/from-uniformity-to-diversity/.

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Soils at Guelph advances sustainable soil management in Ontario by making research accessible and facilitating knowledge exchange between researchers, farmers, industry, government and the public.

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